PATENT COOPERATION TREATY

PCT

10/527486

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference **51454 WO**	**FOR FURTHER ACTION** See Form PCT/IPEA/416	
International application No. **PCT/IB2003/001775**	International filing date *(day/month/year)* **07/05/2003**	Priority date *(day/month/year)* **03/10/2002**
International Patent Classification (IPC) or national classification and IPC **G06F3/023, H04M1/274, G06F17/22**		
Applicant **NOKIA CORPORATION ET AL**		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of ___5___ sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

   a. ☒ *(sent to the applicant and to the International Bureau)* a total of ___3___ sheets, as follows:

      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))

      _____ , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

   ☒ Box No. I   Basis of the report

   ☐ Box No. II   Priority

   ☐ Box No. III   Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

   ☐ Box No. IV   Lack of unity of invention

   ☒ Box No. V   Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   ☐ Box No. VI   Certain documents cited

   ☐ Box No. VII   Certain defects in the international application

   ☐ Box No. VIII   Certain observations on the international application

Date of submission of the demand **05-04-2004**	Date of completion of this report **16-12-2004**
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Nabil Sebaa /LR Telephone No. +46 8 782 25 00

Form PCT/IPEA/409 (cover sheet) (January 2004)

Box No. I	Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on a translation from the original language into the following language _____ , which is the language of a translation furnished for the purposes of:

☐ international search (under Rules 12.3 and 23.1(b))

☐ publication of the international application (under Rule 12.4)

☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

☐ the international application as originally filed/furnished

☒ the description:

pages __1-26__ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* __1-3__ received by this Authority on __08/12/2004__

pages* _____ received by this Authority on _____

☒ the drawings:

pages __1-5__ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☒ the claims, Nos. __17__

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify):* _____

☐ any table(s) related to the sequence listing *(specify):* _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify):* _____

☐ any table(s) related to the sequence listing *(specify):* _____

*   *If item 4 applies, some or all of those sheets may be marked "superseded."*

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-16		YES
	Claims			NO
Inventive step (IS)	Claims	1-16		YES
	Claims			NO
Industrial applicability (IA)	Claims	1-16		YES
	Claims			NO

2. Citations and explanations (Rule 70.7)

The invention concerns mobile electronic phones having a reduced user input interface. It relates to a character input method or method for entering words into a user interface of a device, wherein the method uses the unequally distributed frequencies of words and numbers in a dictionary or a file to predict the most likely user input.

The problem to be solved by the invention relates to the slow and inconvenient process when entering words in a character keyboard of a mobile device. As commonly known, each button in a keyboard is related to several letters. When a user wants to enter a word, he/she is often obliged to push the same button several times to produce a letter of a complete word. The user thus experiences a slow process when using a keyboard in such manner, and would rather prefer a much faster and improved word entry method into an interface.

This International preliminary report on patentability is based on new claims 1-16 received by this authority on 08/12/2003.

The new claims 1-16 differ from originally filed claims 1-17 according to the following:

The new independent claims 1 and 15 have been clarified in that the present invention is directed to an electronic device such as a mobile phone, provided with a roller.

The new claims 1-14, and 16 are in verbatim the original claims 1-14., and 16 respectively.

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of: Box V

The original claim 17 has been deleted.

In addition, in the method claims the passage "which is made up of at least one character" of the step of generating a character subset has been deleted.

Thus, the new independent method claim 1 has been clarified in the feature of generating a subset, in that the character subset includes characters from among which, the next character for the word is most probably selected. It is therefore now clearly specified that the character subset comprises more than one character.

Reference is made to the following documents:
D1: GB 237 39 07 A
D2: US 639 26 40 B1

Document D1 describes a method for entering words and characters into mobile phones having a user input interface. The aim of D1 is similar to that of the claimed invention according to claims 1 and 15 in that, D1 also presents a method and device for improving word entries and increasing the speed in doing that.

According to D1, the method of entering words into the user interface is described, wherein characters of a word are selected from a character set stored in the device.

A predictive character algorithm is provided and the most likely character is presented first on the display as calculated from the statistical database. The prediction of a character is depended on a previously entered character by the user. As mentioned earlier, a database of words is also provided (see abstract, page 2, line 22 – page 4, line 11, and claims 1 and 8 in D1)). An example of how to improve and increase the word input process is described in page 5, line 26 – page 7, line 10 in D1.

The electronic device of D1 is however not provided with a roller, and is strictly directed to 12-key ITU-T-keyboards or QWERTY-keyboards. In addition, a pre-selection input method is

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V

required in D1, wherein a user in a first step pre-selects a certain key in the ITU-keypad, and is restricted to a fixed pre-selection input method. Furthermore, D1 does not allow any ambiguity when entering characters into the ITU-I keypad.

D2 discloses a method for entering words into an electronic device provided with a roller or thumb-wheel. D2 does however not disclose any prediction features and is also restricted to a pre-selective input method. In addition, the input sequence of D2 allows a T9 logic style ambiguity of the whole word.

In contrast, the invention claimed in new claims 1-16 discloses an input prediction method and an electronic device which does not necessarily requires an ITU-T-keypad for entering word; and is not restricted to a fixed pre-selection method of predetermined input characters.

Therefore, neither document D1 nor D2 taken alone or in combination could have given any suggestion to a person skilled in the art which would inspire him to the subject matter of the new claims 1-16 without involving an inventive activity.

Accordingly, the invention defined in new claims 1-16 is novel and is considered to involve an inventive step. The invention is industrially applicable.

Additional documents cited in the international search report:
D3: EP 639 26 40 B1
D4: GB 233 33 86 A
D5: EP 102 85 71 A1

The cited documents D3-D4 represent the general state of the art and the invention according to claims 1-16 is not disclosed by any of those documents.

International Application No.   PCT/IB03/01775
Applicant: Nokia Corporation
Date   December 06, 2004

New Claims

1. Method for entering a word into a user interface of an electronic device, wherein the characters of said word can be selected from a character set stored in said electronic device, comprising:
   generating, for browsing, a character subset of said character set, said character subset including characters from among which, according to an inference logic, the next character for said word is most probably selected,
   displaying said character subset on a display of said electronic device, for browsing and selecting the next character by the user,
   characterized in that said inference logic is based on a database of words and at least one usage parameter related to each of said words, and
   wherein said user interface is a roller, and wherein browse commands are issued by rotating the roller around its axis, and wherein select commands are issued by pressing the roller.

2. Method according to claim 1, wherein said at least one usage parameter for a certain word is related to the individual number of occurrences of usage of said word.

3. Method according to claim 2, wherein said at least one usage parameter for a certain word is related to the individual number of occurrence of usages of said word and the total number of occurrences of words.

4. Method according to anyone of claims 1 to 3, wherein said at least one usage parameter and said words are stored in a database comprising words and said at least one usage parameter, characterized in that said method further comprises:
   adapting the contents of said database after at last one word has been selected.

5. Method according to claim 4, characterized in that said adapting of said database is performed by adding a new word to said database.

6. Method according to anyone of the preceding claims, further comprising storing said

AMENDED SHEET

12. Computer program product comprising program code means stored on a computer readable medium for carrying out the method of anyone of claims 1 to 10 when said program product is run on a computer or network device.

13. Computer program product comprising program code, downloadable from a server for carrying out the method of anyone of claims 1 to 10 when said program product is run on a computer or network device.

14. Computer data signal embodied in a carrier wave and representing a program that instructs a computer to perform the steps of the method of anyone of claims 1 to 10.

15. Electronic device, comprising a user interface for entering words, comprising:
a display (10) for displaying characters and entered characters and character strings,
an input device (4) for issuing commands to browse and select characters, and
a processing unit for controlling the operation of the user interface, the processing unit being connected to the display and configured to display characters on the display, the processing unit being further connected to the input device and configured to receive, from the input device, commands to browse and select characters, wherein said processing unit is further configured to generate for browsing, a character subset made up of characters to be browsed, the character subset including the characters of a character set from among which, according to an inference logic configured into the processing unit, the next character for the word is most probably selected, and display the character subset on the display for browsing the characters and for selecting the next character by using the input device (4),
characterized by a database of words and at least one usage parameter related to each of said words, wherein said database is connected to said processing unit, and wherein said processing unit is further configured to select said character subset according to said inference logic on the basis of said words and said related at least one usage parameter,
wherein said input device (4) is a roller, wherein browse commands are adapted to be issued by rotating the roller around its axis, and wherein select commands are adapted to be issued by pressing the roller.

16. Electronic device according to claim 15, wherein said processing unit is further configured to adapt the content of said database of words and said at least one parameter according to selections of a user received from said input device.

AMENDED SHEET